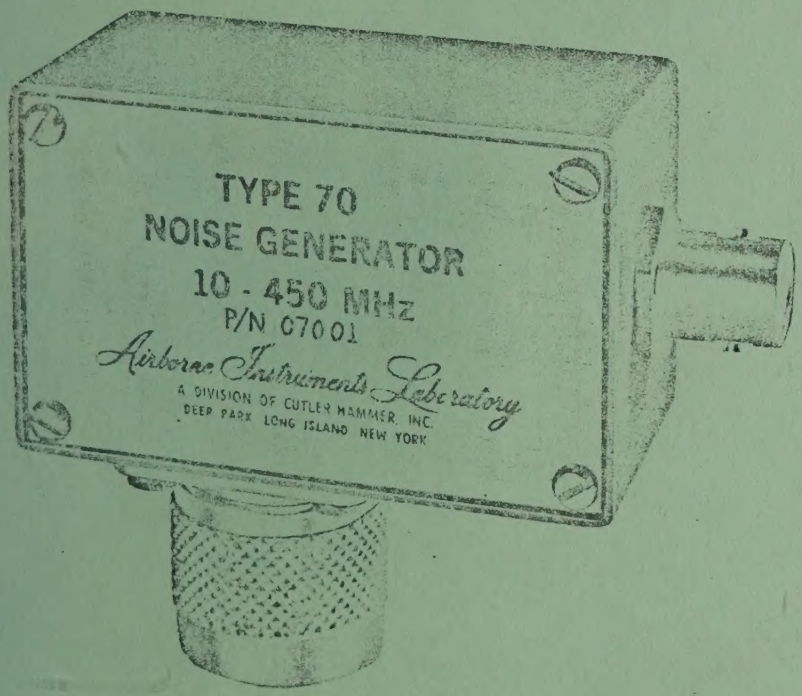
ME-3375
(1-29)

AIL TYPE 70

NOISE GENERATOR



7001 Revision A

AIRBORNE INSTRUMENTS LABORATORY A DIVISION OF CUTLER-HAMMER

INSTRUCTION MANUAL FOR.....

AIL TYPE 70
NOISE GENERATOR

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WARRANTY

Except for tubes, fuses, and batteries which carry no warranty, Cutler-Hammer, in connection with equipment sold, agrees to correct any defect in workmanship or material which may develop during the period of one year from the date of shipment under proper or normal use and not in excess of the original manufacturer's life expectancy ratings, by its option to repair or replace, FOB point of shipment, the defective part or parts, and such correction shall constitute a fulfilment of all Cutler-Hammer liabilities in respect to said apparatus.

I. INTRODUCTION

The AIL Type 70 Noise Generator, Part Number 07001 (Figure 1) is a solid-state noise generator intended for use with the AIL Type 75 Precision Automatic Noise Figure Indicator to make noise figure measurements over the frequency range from 10 to 450 MHz.

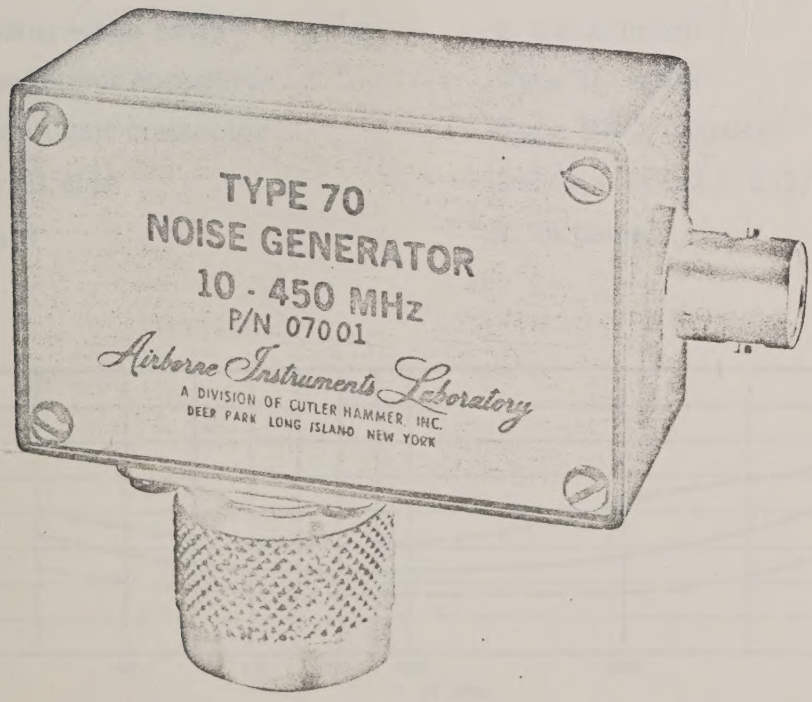

FIGURE 1. AIL TYPE 70 NOISE GENERATOR, P/N 07001

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II. SPECIFICATIONS

Part number	07001
Frequency range	10 to 450 MHz
Relative excess noise temperature	15.2 dB ±0.5 dB (Figure 2)
Operating voltage	10v nominal
Operating current	Nominal 5 milliamperes ±0.1 mA
Current sensitivity	1 dB/mA at 5 mA
Output impedance	50 ohms
Standing wave ratio	1.2 maximum
Noise output connector	Type N, male
Power input connector	Type BNC, female
Overall size	2-3/8 × 1-1/2 × 1-1/4 inches
Weight	0.25 pound

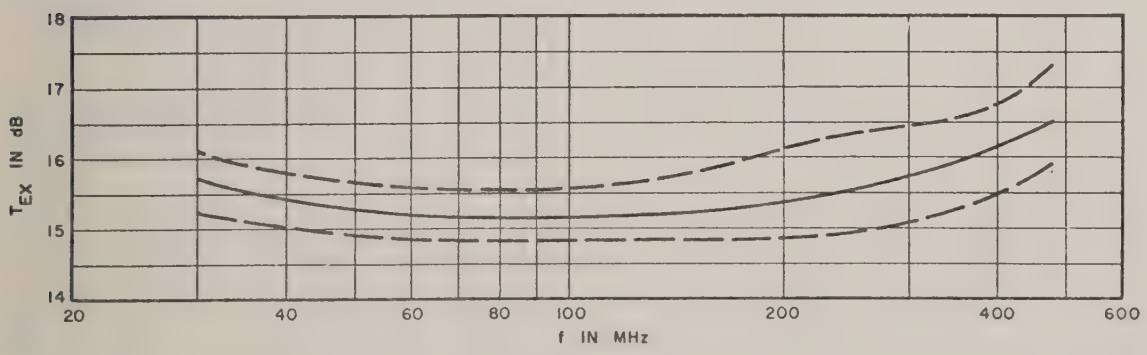

FIGURE 2. T_{EX} VS FREQUENCY FOR SOLID-STATE NOISE SOURCE, P/N 07001

III. OPERATION

The Type 70 Noise Generator P/N 07001, when operated with the AIL Type 75 Precision Automatic Noise Figure Indicator, can be used to make both manual and automatic noise figure measurements. The 07001 is connected by means of a BNC coaxial cable to the diode gate output on the rear of the Type 75 Precision Automatic Noise Figure Indicator. The nominal current for the diode is 5 milliamperes direct current and is factory preset in the Type 75.

The Type 70 Noise Generator may also be operated with a standard laboratory power supply capable of supplying a regulated current of 5 milliamperes at approximately 10 volts. This combination is useful for making manual noise figure measurements with the aid of the AIL Type 136 Precision Receiver.

IV. THEORY OF OPERATION

The 07001 (Figure 3) consists of a solid-state noise source whose excess noise ratio is approximately 28 dB. This source is followed by a 13-dB attenuator which reduces its excess noise ratio to approximately 15 dB, a value commensurate with gas-discharge noise sources used in the AIL Type 70 and Type 80 line. This 13-dB attenuator also serves to improve the standing wave ratio of the device and to minimize impedance variations between noise ON and noise OFF conditions. Typical standing wave ratios of this device are less than 1.2 to 1 over the range from 10 to 450 MHz.

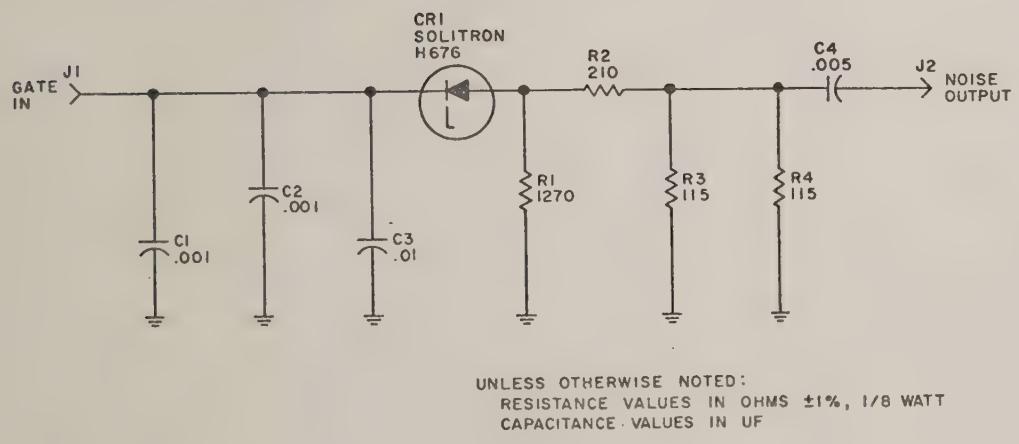

FIGURE 3. SCHEMATIC DIAGRAM OF SOLID-STATE NOISE SOURCE, P/N 07001

V. MAINTENANCE

No preventative maintenance is required for the 07001. A schematic (Figure 3) and Replaceable Parts List (Section VI) have been included to assist in routine troubleshooting.

If it is necessary to return the equipment to the factory for repairs proceed as follows:

Write to the AIL Microwave Instrument Sales Department, Deer Park, New York, giving complete information concerning the nature of the failure and the manner in which the equipment was used when failure occurred. Also provide the TYPE AND SERIAL NUMBERS of the unit. Special instructions will then be supplied to the customer for shipping the unit back for repairs. All equipment should be packed and shipped, in accordance with the instructions supplied, with transportation charges prepaid. A failure report should accompany shipment of the equipment.

VI. REPLACEABLE PARTS LIST

C1, 2	Capacitor Ceramic Disc 0.001 μf 600 v	Sprague	40C-214
C3	Capacitor Ceramic Disc 0.01 μf 600 v		CK63AW103K
C4	Capacitor Ceramic Disc 0.005 μf 600 v	Erie	811-005
CR1	Diode, Noise	Solitron	H676
J1	Jack, BNC		UG625
J2	Plug, N	Amphenol	49000
R1	Resistor, fixed 1270 ohms 1/8 w		RN50D1271F
R2	Resistor, fixed 210 ohms 1/8 w		RN50D2100F
R3, 4	Resistor, fixed 115 ohms 1/8 w		RN50D1150F